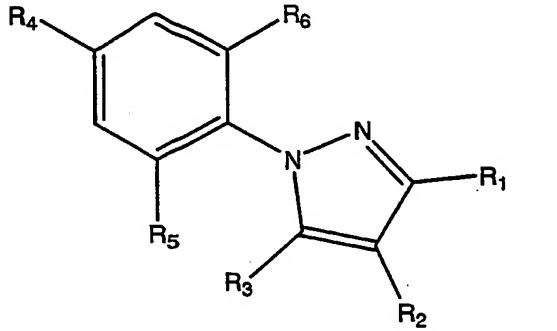


Claims:

1. A lignocellulosic composite material comprising:
5 lignocellulosic particles in an amount of from about 75 to 99.5 parts by dry weight based on 100 parts by weight of said composite material; and
a binder resin in an amount of from 0.5 to 25 parts by weight based on 100 parts by weight of said composite material, said binder resin comprising;
10 a polyisocyanate and at least one of an insecticide and/ or at least one of a fungicide dispersed throughout said polyisocyanate and dispersed throughout said lignocellulosic particles.
2. A composite material as set forth in claim 1 wherein said polyisocyanate is selected from at least one of diphenylmethane diisocyanate and toluene diisocyanate.
15
3. A composite material as set forth in claims 1 or 2 wherein said polyisocyanate is present in an amount of from 0.5 to 25 parts by weight based on 100 parts by dry weight of said lignocellulosic material.
20
4. A composite material as set forth in claims 1 to 3 wherein at least one of an insecticide and/ or at least one of a fungicide are present in an amount of from 1 to 500 parts per million based on the dry weight of said lignocellulosic particles.
25
5. A composite material as set forth in claims 1 to 4 further comprising a single layer having a thickness of from 0.1 inches to 2 feet with at least one of an insecticide and/ or at least one of a fungicide dispersed throughout said layer.
30
6. A composite material as set forth in claims 1 to 5 further comprising a plurality of layers with each of said plurality of layers having a thickness of from 0.1 inches to 6 inches, with at least one of an insecticide and/ or at least one of a fungicide dispersed throughout each of said plurality of layers.
35
7. A binder resin for forming a lignocellulosic composite material, said binder resin comprising:
a polyisocyanate;
a polar solvent; and
40 at least one of an insecticide and/ or at least one of a fungicide dissolved in said polar solvent to form a pesticidal solution;
wherein said polar solvent is capable of dissolving at least 10 grams of at least one of an insecticide and/ or at least one of a fungicide per one liter of said polar solvent.

8. A binder resin as set forth on claim 7, comprising
a polyisocyanate;
a polar solvent; and
5 a pyrazole insecticide dissolved in said polar solvent to form an insecticidal solution;
wherein said polar solvent is capable of dissolving at least 10 grams of said insecticide per one liter of said polar solvent.
- 10 9. A binder resin as set forth in claims 7 or 8 wherein said polar solvent is selected from at least one of an alcohol, a ketone, and an ester.
- 15 10. A binder resin as set forth in claims 7 to 9 wherein said polar solvent is selected from the group of octyl alcohol, isopropyl alcohol, methyl alcohol, acetone, carpryl alcohol, propylene carbonate, gamma-butyrolactone, 3-pantanone, 1-methyl-2-pyrrolidinone, and combinations thereof.
- 20 11. A binder resin as set forth in claims 7 to 10 wherein said polar solvent is present in an amount of from 0.1 to 20 parts by weight based on 100 parts by weight of said binder resin.
- 25 12. A binder resin as set forth in claim 7 to 11 wherein said polyisocyanate is selected from at least one of diphenylmethane diisocyanate and toluene diisocyanate.
13. A binder resin as set forth in claims 7 to 12 wherein said at least one of an insecticide and/ or at least one of a fungicide are present in an amount of from 0.001 to 10 parts by weight based on 100 parts by weight of said binder resin.
- 30 14. A binder resin as set forth in claims 7 to 12 wherein the at least one of an insecticide and/ or at least one of a fungicide are present in at least one of a powder form and a granular form prior to being dissolved in said polar solvent.
- 35 15. A composite material as set forth in claims 1 to 6 or a binder resin as set forth in claims 7 to 14 wherein said insecticide is selected from at least one of the following: pyrazole insecticides, pyrrole insecticides, pyrethroid insecticides, amidino-hydrazone insecticides, semicarbazone insecticides, and neo-nicotinoid insecticides.
- 40 16. A composite material as set forth in claims 1 to 6 or a binder resin as set forth in claims 7 to 14 wherein said fungicide is selected from at least one of the following families: azoles, benzimidazoles, morpholines, dicarboxamides, and strobilurines.

17. A composite material as set forth in claims 1 to 6 or a binder resin as set forth in claims 7 to 14 wherein said pyrazole insecticide is of the general formula:



5 wherein

R₁ is cyano, C₁-C₆-alkoxy, or C₁-C₆-alkyl,

R₂ is S(O)_nA, wherein A is C₁-C₆-haloalkyl and n is 0, 1, or 2,

R₃ is hydrogen, amino, or C₁-C₆-alkyl,

R₄ is C₁-C₆-haloalkyl, and

10 R₅, R₆ are halogen.

18. A composite material as set forth in claims 1 to 6 or a binder resin as set forth in claims 7 to 14 wherein said pyrazole insecticide is fipronil.

15 19. A method of forming a lignocellulosic composite material as set forth in claims 1 to 6, said method comprising the steps of:

dispersing at least one of an insecticide and/or at least one of a fungicide in a polyisocyanate to form a binder resin;

20 forming a lignocellulosic mixture by mixing lignocellulosic particles in an amount of from about 75 to 99.5 parts by weight based on 100 parts by weight of the lignocellulosic mixture with the binder resin in an amount of from 0.5 to 25 parts by weight based on 100 parts by weight of the lignocellulosic mixture; and
forming a lignocellulosic composite material by compressing the lignocellulosic mixture at an elevated temperature and under pressure.

25 20. A method as set forth in claim 19 wherein the step of forming the lignocellulosic mixture is further defined as comprising the step of mixing the lignocellulosic particles with the binder resin to coat the lignocellulosic particles with at least one of the insecticide and/or at least one of the fungicide.

30 21. A method as set forth in claims 19 or 20 wherein the step of forming the lignocellulosic composite material is further defined as forming a single layer having a thickness of from 0.1 inches to 2 feet with at least one of the insecticide and at least one of the fungicide dispersed throughout the layer.

22. A method as set forth in claims 19 or 20 wherein the step of forming the lignocellulosic composite material is further defined as forming a plurality of layers with each of said plurality of layers having a thickness of from 0.1 inches to 6 inches with at least one of the insecticide and the fungicide dispersed throughout each of the plurality of layers.